

TECHNICAL DEPT. AVIATION

The Oldest American Aeronautical Magazine

JANUARY 23, 1928

Issued Weekly

PRICE 20 CENTS



A reconnaissance plane on patrol over the Quilali area in Nicaragua

VOLUME
XXIV

Special Features

NUMBER
4

Aviation in the West
Airway Passenger Stations
The New Bellanca Monoplane

AVIATION PUBLISHING CORPORATION
250 WEST 57 STREET, NEW YORK

Publication Office, Highland, N. Y. Entered as Second-Class Matter, Nov. 22, 1920, at the Post Office, at Highland, N. Y. under Act of March 3, 1879.

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Vol. XXIV January 23, 1932 No. 4

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AVIATION PUBLISHING CORPORATION

Business and Editorial Office
220 West 53rd St., New York City
Cable Address: AEROCENG

Publisher's Office: Highland, New York
Subscription prices: Four dollars per year, Canada, five
dollars foreign. Air delivery per year, Canada, five
dollars foreign. Single copies, 25 cents. Advertising rates
upon application. Special rates for libraries. Please write for
free circular. Entered as second-class matter Nov.
10, 1910. Post Office at Highland, N. Y., under no. 4.
Acceptance for mailing at special rate of
\$1.00 per copy authorized by Section 1103, Act of Oct. 3, 1917.



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Hartford, N. H., U. S. A.

WRIGHT



The Oldest American Aeronautical Magazine

Vol. XXIV

JANUARY 23, 1920

No. 4

"Dusting" Pilots

SOMETIMES THE pilot, in a rush to get off the ground and be on his way to a distant destination, forgets to have his plane loaded a sufficient distance away from an open hangar before running up his engine. And, as a result, when the engine is revved up a great cloud of dust and dirt goes swirling into the hangar to collect on the planes and engines stored inside. Such is particularly annoying on a hot summer's day when the earth in front of hangars is powder dry, and any pilot who has had the misfortune to have his plane so "bombed" can well appreciate the trouble and time it takes to clean up afterwards.

At week fields care is being taken that such an event does not occur. However, the practice is by no means strict, and as a means of making it so, flying field managers should wear all pilots as well as visiting pilots against running up planes when they are close to open hangars. It takes a relatively small amount of time to load the plane to a safe distance, and, if needs must, it is but a small effort to point the tail of the plane in any other direction, and the precaution would prove highly advantageous to the owners of the other planes in the hangar.

The Airplane Mechanic

AMONG THOSE who have contributed in no small measure to the present success of aviation, and yet have received little or no publicity of their efforts, are the airplane mechanics. As any experienced pilot knows, an AI mechanic is a valuable asset in securing maximum service out of a plane. To his judgment is often left the loading of the details. Details that are all important factors in the efficient operation of the engine.

Like many of the war time pilots, many of the war time mechanics, who "cut their teeth" as flying fields both here and in France, have stuck with the game. Some of them have since graduated to the class of active pilots, while others have "won their wings" yet have continued with their work in the repair shops, such as they may be. But all of them, including the others, know their business and are worthy of the careful consideration of the aviation company executive who wants successful and dependable men to work on his planes.

Aeronautics holds a future for the mechanic as well as it does for the pilot, engineer, designer, etc., and men so trained should be encouraged to follow that line of work. If given proper opportunity they can become

valuable parts of a successful organization. But there should be a standard of workmanship required and airline operators, flying school operators, manufacturers, etc., should make sure that the mechanics they hire to work on planes, particularly the passenger planes, are fully capable of doing the work.

Perhaps not so much at present as in the near future, aviation will present a lure to the automobile mechanic. It may be usual interest in a new field, a desire to progress, or the prospect of big money that will cause him to switch avoc. However, an automobile mechanic is not necessarily an airplane mechanic. He often requires coaching in the trials of the new art. And operators should be doubly certain that the "guy" repair man does not get "his fingers in the pie".

A poor mechanic can unknowingly ruin a perfectly good airplane engine. Upon the mechanic's skill and workmanship is dependent a goodly portion of the operating and maintenance cost. Such being so it seems highly plausible that those in charge should exert almost as much care in the selection of their mechanics as they do in the selection of their pilots. And as regards the beginners, they should be encouraged and programs made, by instruction schools or otherwise, whereby they can obtain the necessary training to fit them for the work.

Dealer Education

A POINT THAT airplane manufacturers should bear in mind when appointing an individual or company to represent them as a dealer, is that the sales success of their product in that particular locality will be in accordance with the business success of the dealer. Therefore, if the manufacturer takes time to educate the appointed dealer in the company's policies and desires ready to cooperate in the handling of the various local problems that are bound to arise he will go far towards leading dealer enthusiasm and obtaining full quota territory sales returns.

All present all of the manufacturers are selling planes retail, but as production increases and national distribution becomes a definite reality practically all retail selling will be in the hands of dealers. They will do local advertising as a follow up of the national advertising done by the manufacturer, and they will have their own types of sales letters and sales methods, etc. Therefore, the manufacturer who considers a dealer as a vital part of his business, regardless of that dealer's locality, and renders him complete cooperation and assistance in the conducting of his business will undoubtedly find his efforts well rewarded on the sales ledger.



The airway station at Ebro Field outside of Brussels, Belgium.

Airway Passenger Stations

The Need of Suitable Buildings at American Airports as a Means of Inducing the Public to Travel by Air

By RICHARD V. MURISON*

Architect

THE TWENTIETH Century Limited to New York is about to leave Chicago, you are ready to board it in the center of a large field about 16 miles from the center of Chicago. The weather is hot, raining, and you are waiting in a round-house or repair shop for its departure. Of course that is ridiculous, but suppose this was the arrangement for boarding our modern American railway today. Would you not turn to a more convenient transportation, even though it might take a little longer to reach your destination?

This is exactly what the American Aerial Transportation companies are expecting the American Public to put up with if it travels by air. The American Public, educated in the business, accessibility and accommodations of our great railway system and terminals are expected to travel by air. It is asked to board the airplane ten to fifteen miles from home; reach the airport by automobile or taxi, on a hot's ride possibly. It is asked to stand and wait in a dirty hangar or shop, until the plane is brought on the field. It then tramps through miles of mud to the waiting plane. What conditions has it in such a means of travel? Has air travel any dignity approached in this manner?

In Europe, backward as they are in the equipment and housing of almost every other type of commercial enterprise, they are keenly alert to the fact that air transportation must

be given a terminal station or airway station of equal dignity and importance to that of any other type of transportation. Each large airport of Europe today has built, or is building, an "Airway Station" similar to a railway station which would be justice to a railway station serving a city of a hundred thousand population. True taxis and cabs are used during the arrival and departure of large air lines from these stations, and the planes usually arrive and depart on the tarmac. The administration, efficiency and complete housing of air transportation lends a dignity to this brief and most effective means of travel which helps to gain the confidence and respect of the traveling public.

During recent months so much has been written about need of landing fields and airports that it is needless to delve into any further discussion of that subject, but rather to



One of the buildings at the new Croydon, England, flying field.



A group of the buildings at Tempelhof, Germany's well known field located at Berlin.

lost of the business section. But this is exactly what is needed. Most American cities are built around their railway system and are planned for railway transportation facilities only. What then is the airway transportation company to do for its facilities to the business and industrial center? First, last, Croydon, Chicago, Boston and one or two other cities are solving this question by building artificial islands on their river and water fronts, connected to the mainland by causeways. On these islands they are planning and constructing air transportation landing fields, using other fields on the outside of their city for the storage and maintenance of the planes, just as a railway system has its round-house and shops located outside of the city limits.

Utility of Flying Boat Piers in Europe

The wheel somewhat solves the problem, not only of local travel, but also affords a protected airport for airplanes and large flying boats. The importance of the flying boat for use as an airplane is being proven daily in Europe where on the western flying boats over a large route passing only over water which is the most efficient line to operate.

If no body of water is available for the artificial island scheme, for the reason nearby the usual waterfront area of high ground, well drained and level with a slight curve to the water which has many advantages for drainage and tide-falls. In addition to the topography of the field, the surrounding property must be free from obstructions, trees, telephone lines and poles and, in fact, it is most desirable to clear the site of all existing buildings, except which the plane is to be landing or taking off.

The airplane airport presents a different condition than the experimental landing field. To be a passenger airport, the field must be laid out on the plane may lead direction of the wind and space landing field with its station with its range of passenger, baggage,

mail and freight without delay and by the shortest route. To locate the buildings in the path of landing planes and the point of take-off of departing planes then becomes the problem of planning the passenger airport. The Department of Commerce in its bulletin on landing fields designated them as two-way, three-way, one-way and airway landing fields. An airway landing field, is, of course, the best and only sort to be used for airway traffic, of the sort we are now considering.

Starting with the old wartime fields of Europe and America, efforts were made to turn these fields into commercial airports which were for the most part square or oblong in shape and the buildings were located along one or more sides so that as the requirements grew the new buildings, stations, and shops threatened to enclose these fields that a landing plane was forced to land in the middle of the field and then a long distance back to deposit its cargo and passengers. Even at Tempelhof at Berlin which has up to the present time been considered the finest commercial airport in the world, they recognize the fact that unless the buildings are rearranged the field will soon become completely clogged and impractical for commercial transportation.

Plan Hotel at Tempelhof

At Tempelhof they now have a large passenger waiting room and excellent restaurant, beautifully decorated and equipped, baggage and baggage rooms, custom and administration offices. They are planning now to build a hotel in connection with the present buildings, where pilots and passengers arriving late or leaving early in the morning may spend the night if they desire.

At Croydon, England, a year ago they began to rebuild the airfield completely and as soon as the new buildings are completed they will destroy the old temporary sheds and hangars and extend the field to make it almost twice its present size. The new buildings at Croydon, are the last word in airport station design and consist of the main passenger station with its quarters for offices, administration and executive affairs, the custom and mail tower, baggage, freight, and departments and custom offices. In connection with



The dining room in the passenger station at the Tempelhof flying field.

the main passenger waiting rooms, they have an excellent restaurant and other features for the convenience and comfort of the traveler.

At one side of the new building which is nearing completion, they are now constructing a four story steel and concrete hotel, to be as complete and modern as any hotel in London. On the other side of the new buildings are the shops and hangars, all constructed by concrete runways. At

*This article was written by R. Murison as the result of a trip to Europe last summer during which time he saw some of the newest and finest of the present airports in that part of the world.—Ed.



Front quarter view of the new Bellanca monoplane, Model J

The New Bellanca Monoplane

Model J is the First of a Series of Closed Cabin Monoplanes and is Powered With a "Whirlwind" Engine

By RICHARD M. MOCK

THE FIRST plane to be completed by the Bellanca Aircraft Corp. of America was recently completed and flown for the first time at Miller Field, Staten Island, N. Y. It is very much like the "Columbia" used by Chamberlain and Levine on their record-breaking trans-Atlantic flight last summer. A. B. Martin is the owner of the plane and he has had it fitted with large fuel tanks for a contemplated endurance flight. This plane, which is the Bellanca model J, is the first of a series of new closed cabin monoplanes to be completed at the Arlington, Staten Island, N. Y., plant of the Bellanca company. The new succeeding models of this series are of the model CH which is very similar except that they will be fitted as air passenger cabin monoplanes. The model J is four feet larger in span and also has a large gasoline tank in the fuselage, placed behind the pilot's cockpit. It is considered that an effort will be made with Martin's plane to repeat the world's endurance record once made by Chamberlain and Levine in the Bellanca monoplane, Columbia, and since broken by the two German aviators Lindbergh and Gannett.

Original Type of Cantilever Landing Gear

The Bellanca monoplane is of quite conventional design having an extensively braced wing with a welded steel tubular fuselage and wood wings covered with fabric. It has a very unusual type of cantilever landing gear, very similar to that on the first Wright Bellanca monoplane, the predecessor of the Columbia. Powered with a Wright Whirlwind engine the Model J is stated by the manufacturers to have a high speed of 130 m.p.h., and a landing speed of 40 m.p.h., carrying a load of 1300 lb. As the plane weighs 3415 lb. empty it has a total weight of 3915 lb. The model CH, the cabin passenger type, weighs 1650 lb. empty and with 1150 lb. per load, including pilot, gasoline and oil, it has a total weight of

2000 lb. With this load it is stated to have a high speed of 120 m.p.h., and a landing speed of 40 m.p.h.

The fuselage is of welded streamer molybdenum steel to simplify production problems, handling, etc., it is built in two main joined at the longbones by bolts. The forward and last conventional form with an nose bracing while the tail and which extends from the rear of the cabin backward, is braced by tie-rods. By the removal of four radial steel bolts and disconnecting the control cables the fuselage can be easily divided into two parts for transport or storage. The false covering is joined at this point with an extra strap over the joint. The longbones are tubular at the nose most of the remainder. The vertical members at the side panels, at the rear spar point, are of two inches with a long narrow oil strap welded between them. This gives a form of I beam with its greatest moment of inertia in a plane across the fuselage. There is also an extra longitudinal member of this type at each side of the fuselage at approximately the height of the third line. As the member is curved in the direction of the fuselage the two tubes are bent to conform with the curve and a steel sheet, also curved, is welded between them. The only other points where plate metal tubes are not used is for the members across the fuselage between the two spars. These members are of light steel steel bent into a loop shape with flange channels welded to the vertical sides of the loop of a Warren truss. On the latter models the sheet is not between the channels is cut away to lighten the structure. At all points in the fuselage the members meet cornered and the joints are not reinforced except below the door where a knee fitting is used. The fuselage structure shows a great deal of ingenuity, especially at those points where the aircraft has been made from conventional design to make a lighter weight and still maintain the strength. The design of an air section upon seems to have given many designers a considerable trouble but Mr. Bellanca seems to have solved it quite well in an efficient manner.

On the model J, which is fitted for a long distance flight

destroys no door to the cockpit. Entrance is made through the door which slides back. The forward portion of the side is shown in an angle so that the entire side of the cabin can be opened if desired. The two shatterable glass windows at the rear of the cabin slides upward, over the pilot, and the cabin perfectly open. The top of the cabin behind the pilot's seat, which is really the upper portion of the fuselage, is hinged giving the pilot a wide range of visibility. These sliding windows provide good ventilation while the door is closed. A heater is used to warm the cabin in cold weather. This heater consists of a piece of sheet metal bent and welded into the shape of a flat tube and then welded to the sides of the fuselage so that the incoming air is heated by the exchange on its way to the cabin. The air intake is small and is placed so that it does not increase the resistance appreciably. A valve is provided so that the heater can be turned off when desired.

Fitted With Dual Side by Side Control

The cockpit is fitted with dual side by side control with metal pedals also equipped by cables and positively actuated. A stick at the left is connected to a worm gear at the tail to adjust the stabilizer. The cabin goes over motorized pedals with ball bearing wheels. A complete set of standard instruments is mounted on the instrument board. The pilot sits on the oil tank behind which, on the model J, is the main fuel tank of 300 gal. This tank, which weighs approximately 200 lb., is rectangular in shape with a space above it for fuel is not in during a long flight or for extra gasoline tank. The Columbia was fitted in a similar way and both Chamberlain and Levine put some sleep on top of the tank during their long flight. The tank is fitted with two air lock deep valves



Only—Bellanca (right) and A. B. Martin inspecting Model J during construction.

so that no contents can be dropped quickly. At the top there is a two inch vent so that no air may enter the tank when it is being emptied. Aside from the feature of dropping the gasoline in case of an emergency, deep valves such as these are very useful during long flights. The tank may be filled with water and in the case of too great a load it can be



Showing the full cantilever landing gear and cowling on the new Bellanca monoplane.

dropped quickly without increasing a great expense. Behind the tank is a space for magneto or pump.

The model CH has the cabin fitted with four window chairs behind the two pilot's seats. On this type the side of the cabin are fitted with sliding windows and near the front there is a door at the left side. Electric light is provided and the cabin is also heated by the engine exhaust. To the rear of the cabin is a large space and toilet. This compartment is fitted with an oval window.

Wings are of Wood

The wing is of wood with two metal I beams for spars. In addition there are three 1/2 in. square spruce members placed longitudinally with one on top and one on bottom to brace the wing ribs. Mr. Bellanca evidently does not desire false tips for preventing the ribs from twisting. These strips do not increase the weight by very much and they surely do take part of the torsional load in the wing. The ribs are quite aluminum, with wood members arranged in a Warren truss. The cap strips are made up of two flat pieces placed together in the form of the letter T. The cross bracing is of plywood with the two outside layers fastened to the stem of the T that makes up the cap strip. The ribs are fastened to the spars by triangular blocks. These blocks are placed on each side of the spar and fastened to the spar with the ribs attached to the blocks. The compression ribs are identical to the others except that there are additional solid spruce members between the spars on each side of the ribs. At the outer bays these compression members are riveted as one side to give a complete section reducing the weight. The ribs by Stewart Horstman complete the wing bracing.

In the wings on each side of the fuselage is a 50 gal. fuel tank. In order to take the wing loads over these tanks the compression ribs on each side are built into a box. Under the tank there is a plywood panel partly supporting the tank and sitting on the lower surface of the wing. These tanks may be removed through the top of the wing. At the inner edge of the tank is adjacent to the side of the fuselage the fuel

lines are very short. They enter the forage mass in the over-flow gauge which is at the top and front end of the mare feed tank.

The wings, which have a section differing slightly from that used on the Columbia, do not taper either in plan or section. All ribs are the same except the two outer ones which provide for shape of the wing tip. The tip is rounded off with a piece of balsa wood. Long narrow slots of high aspect ratio are used. Navigation lights are provided with the wing recesses along the forward spar.

Send Structures Similar to Wing Structure

You attach them to the bottom of the fuselage like support wings normally. These struts have a structure very similar to that of a wing having an airtail section, a single spar, ribs, fillets, etc. The struts taper from a wide chord with an airtail section near the fuselage to a very narrow chord and an almost streamlined shape at the wing. The wing is attached to the wing and continues the wooden part of the strut and the wing spar is a steel tube. This gives only a small obstruction on the lower surface of the wing maintaining the interference of the airflow over the bottom. At the point of attachment between the strut tube and the strut spar the joint is adjustable so the wing can be tilted up or down. The struts supporting the struts at the angle of incidence of the nose wing may be changed or by changing both the dihedral of the wing can be varied slightly. The angle of incidence of the lift struts can also be varied at the root. These struts, which provide more lift than those on weight, are at a high dihedral relative to the lateral axis.

The tail surfaces are of wood and very similar in structure to the wing. The bracing is also of wood connecting all two rods. As has been mentioned the structure is admirable for

where gear carrying the setting of the rear portion and the forward portion is hinged. This surface is not reinforced by two struts the setting of which can be varied. The other tail surfaces are braced by struts running forward, in the usual manner. Similar to the rest of the structure the tail surfaces are covered with fabric and finished with dope and then varnished down.

Landing Gear of Original Design

[illegible]

The tail shaft is of conventional construction. It is driveable with the rudder and is pivoted below the stern post in a bronze bushing. The shaft itself is of wood and is supported by rubber. The entire unit is accessible from the outside on each side of the fuselage as transparent windows lend a sense for smoothness, elegance and for peace.

The manufacturers' specifications are as follows:

	Model J	Model CE
Speed (m/min)	50 ft	40 ft



Side view of the 101. Rehearsal airplane, Model J, under construction at the Bellman Aircraft Corp., at Longhemp, Utah Island, N. Y.

Commercial Aircraft Sales Co.
Will Distribute Lincoln-Page

NEGOTIATIONS HAVE just been completed between the Commercial Aircraft Sales of Chicago and the Lonsdale Aircraft Co., manufacturers of the new Lonsdale-Page plane, giving the Chicago company the exclusive distributorship for the State of Illinois and each part of Wisconsin and Indiana as well as non-exclusively handled from Chicago.

The first Lincoln-Pape was flown recently to Chicago by E. H. Smith and Erwin Baumgart, sales manager for the company. The plane made the stormy trip in record time.



The first Lunda-Page recently flown to Chicago by E. R. Frank (male) and Ervin Baumgart.

and was met by an enthusiastic crowd. General education was expressed at the beautiful appearance of the plane as it whirled down over the field and came to a graceful stop.

The flight from Lincoln was generally successful, but the low visibility on the entire route made flying rather difficult. In some places the fog was so thick that the plane passed through terrible clouds, shutting off all view of the earth below.

At the beginning of the flight the thermometer registered only a few degrees above zero, and with the propeller blades furnishing a brisk nor'easter, both pilot and passenger were exposed to considerable cold.

Scenic Airways, Inc., Approved
By Local Chamber of Commerce

THE BOARD of governors of the Salt Lake City Chamber of Commerce has given its approval to the Boone Airway Incorporated. This airline is part of a projected system which will reach all national parks and which J. Parker Van Zandt, president, has been engaged in promoting for more than a year.

The Santa Airways proposes to inaugurate an airmail and passenger service between Salt Lake, the Grand Canyon, Phoenix, Tucson and Nogales, as well as other points in Arizona. When that airway is established, it will be extended into old Mexico, declares the company.

From Nogales to the Mexican coast at Guaymas through Mazatlán, Guadalajara to Mexico City is distance of 1873 mi.) would be the longest route. From El Paso through the Chihuahuan and Toraimes to Mexico City would be the shortest line, 1225 mi.

The plan of the Seaside Airways is to begin service this summer. A survey of the terrain to be traversed and landing fields have already been made and located.

Marshall Flying School Reports A Steady Enrollment of Students

STUDENTS ARE enrolling in the Marshall Flying School at Marshall, Missouri, at the rate of from three to five per day, according to a monthly report issued by David G. Hays, general manager.

During the 30 day period of from Nov. 1 to Dec. 1, 2002, total of 24 students from 25 different clinics were enrolled for both the Flying Course and the Ground Course at the 4-6d. In addition other students have enrolled for either one or the other of these courses instead of both.

The Marshall Island is now flying off its new four-way bid. The first of the steel hangers is up and in use, the 28 ft. marker is installed; the entire field has been graded and rolled and three acres have been fenced off and reserved for automobile parking purposes.

Based visitors to Marshall by air have included T. Claude Ryan, president of the Ryan Aeronautical Corp.; J. B. Alan Mills, sales manager of the American Aircraft Corp.; and members from the American Eagle, Phoenix, Wren and other aircraft factories.

In addition to drying and mending and expert groom work, students at the Marshall School are given theory and assistance in Joe Walter M. Darling, one of the foremost area breeders.

Salt Lake-Great Falls Air Mail Contract Given to Alfred Frank

PUR COVERAGE for carrying mail by air between Salt Lake City, Utah, and Great Falls, Montana, was awarded to Route Air General. Now recently to Allied Frank of Salt Lake City representing himself and a group of Salt Lake City businessmen.

Mr. Frank's bid of \$9.475 per pound was the lowest of the five bids submitted. Bids were opened Dec. 28. Under his contract, Mr. Frank will use five manufacturers of American-made paper, the make not being specified.

Aviation in the West

Some Facts and Figures on Airplane Manufacturing and Operating Activities on the Pacific Coast

By ANDREW H. DOONE

SKEEPLY Western aviators feel that aviation is due for a steady and rapid growth in the United States and recently the Transportation Advisory Board, one of the strongest organizations of its kind, formed an aviation committee of which W. O. Spillway of Arizona is chairman and G. S. McElwain of San Diego vice-chairman. This committee already has surveyed Washington, Oregon, Nevada, Arizona, New Mexico and California, taking cognizance of both the manufacture of aircraft and the operations of commercial planes in the air and on the ground.

"Greatest conditions in this territory have been particularly favorable for the operations of planes and for their manufacturers," the committee reports. "The geographical conditions are widely separated cities and a great deal of maintenance and air supply have contributed to the enormous operations of aircraft. All of these things plus the culture and taste of the people in this territory have combined to give the Pacific Coast region an enviable position in the aeronautical world."

Find Industry Well Established

The committee feels strongly that the aviation industry is well established on the Pacific Coast and is now in a rapidly developing stage. At the present time there are eight recognized airplane manufacturing concerns on the west coast, seven of these being located in California and one in Washington. Of these eight, four are on a subsidiary factory production basis. These are the Douglas Airplane Co. of Seattle, the Douglas Co. of Santa Monica, the International Aircraft Corp. of Long Beach and the B. F. Mahoney Aircraft Corp. of San Diego.

These manufacturing enterprises have made valuable contributions to the development of commercial aviation.

Only recently the Boeing company confined its activities largely to the manufacture of military planes. In this field they have ranked with the leaders of the nation, producing some of the outstanding airplanes of the Naval Air Service. Recently the Boeing company manufactured 26 specially designed planes for use in the trans-continental air mail service from San Francisco to Chicago. The 26 planes are equipped with 425 hp radial air-cooled engines and are designed to carry four passengers in enclosed cabins and contain large storage spaces for mail. The operation of these planes to date indicates that it was among the best developed for combined mail and passenger service.

The planes manufactured by the Douglas company at Santa Monica have taken important places in several great flights. The most important of these was four Douglas planes used in the "Around the World Flight," conducted in 1931 by the Army Air Corps. Douglas planes also were used in San Diego during 1933 when the first "red-tailing in mid-air" experiment was conducted successfully.

The B. F. Mahoney Aircraft Corp. at San Diego, advised by the writer in *Aviation* monthly, during the past few months short time it has been manufacturing airplanes, has given a place among the foremost producers. Of course the outstanding achievement of this organization is the construction of Col. Charles Lindbergh's "Spirit of St. Louis," the present time the Mahoney organization is manufacturing a cabin monoplane known as the Ryan Bronco. It employs a Wright Whetstone 229 hp engine. These limited planes are in use throughout the United States.

The International Aircraft Corp. of Long Beach, the a newcomer in the manufacture of aircraft, has developed rapidly that the monoplanes it produces it will become one of the foremost companies in the near future. The International Aircraft Corp. started operations on Feb. 9, 1932, at that time it had a lot of ideas. Today it employs approximately 100 people and has a payroll averaging \$3000 weekly. The company turns out three planes a week, at about \$10,000 and it is located in Orange.

"The first question that the layman asks when visiting a factory," the management reports, "is, 'who do you sell to?'" This is a natural question for even today the pilot though intended to entertain, does not realize that aircraft is not making, but is built. Our sales manager reveals the average of 100 letters daily from all points in the United States and from foreign countries.

"It has been said that the aviation industry is in its infancy today as the automotive industry was 35 years ago."

A Bird's Eye View



Aerial view of the Cranfield airport in Spain, showing the runway and surrounding landscape. The new Madrid-Barcelona-Madrid airline is in operation, with the new Madrid-Barcelona-Madrid airline in operation, with the new Madrid-Barcelona-Madrid airline in operation.

The aviation industry is in a far better position than was the automotive industry at that time for the reason that the aviation problems before us have been more or less eliminated by the progress in the automobile industry."

In addition to the established companies in the Pacific coast are others are just getting into a position to produce airplanes on a larger scale. The Lockheed Aircraft Company of Burbank has recently developed a fine cabin monoplane. The plane is made entirely of wingroot plywood, and is capable for six passengers and a pilot. One of the outstanding features of this plane is the fact that it develops a high speed of 135 m.p.h. while powered with the Wright Whetstone when carrying a full load. The Lockheed is just entering a production schedule of ten planes monthly. This will be increased in the near future.

Although the Brown Aircraft Construction Co. of San Francisco only recently started factory production, it has made an notable contribution to the development of monoplanes. This company built the "A-100," flown by Martin from San Francisco to Honolulu to take second place in the Solo race. This plane was one of the first to be produced by the Brown company.

Two organizations on the Pacific coast have started production of all metal planes, using decidedly a first rate material for all structural parts. An important part of the property of this metal may be noted in the fact that it has no lightness of aluminum and the strength of steel. The Tuck Airplane Company of San Francisco is just completing its first metal cabin monoplane, using the Wright Whetstone engine, while the Producers of the Ryan Airplane Company has completed the first all-metal cabin monoplane. The Producers plane attains a title of Ryan-Sumner engine.

Conditions Favorable to Development

The Pacific Coast has contributed in a large measure to the development of commercial aviation in the United States and is keeping pace with the present trend in aviation. The aviation created by these eight enterprises definitely points to the future progress that may be expected. Conditions on the west coast have been particularly favorable to the development of commercial aviation and as a result, the west coast air lines are in operation. One of these is the longest haul of any air mail service in the United States.

Three four concerns are the Western Air Express, operating from Los Angeles to Salt Lake City; the Boeing Air Transport, operating the territory between San Francisco and Chicago; the Pacific Air Transport, flying between Los Angeles and Seattle; and the Madison Airline, between Los Angeles and San Diego. All these have set fine records for speed.

On these air mail operations are using airplanes manufactured on the Pacific coast. Douglas mail planes take the air for the Western Air Express. P.A.T. uses Ryan planes and Boeing employs Douglas. A recent survey of these three companies reveals some interesting data. The information which operations from Sept. 1, 1933, to the same date in 1934, for P.A.T. and W.A.E., but only the months of July and August for Boeing, due to the fact that this month was only operated from government operation the first of July.

Operative results follow:

W.A.E.	1,320,645
Boeing	1,321,065
P.A.T.	1,641
Total	2,661
Fixed liabilities due to engine or mechanical trouble	57
Mail carried, lb.	223,425
Passenger carried	875,450.78
Total	1,109

Safety First, Twice



Air action photo of two Navy parachute jumpers on their way to Waikiki Beach after having "stepped off" a plane at 10,000 feet over North Island, San Diego, Calif. Above the double parachute and also the plane which is about to fly through the bottom of the picture.

"When it is reached," reported G. S. McElwain to the aviation committee, "that the figures of the Boeing company only include operations for two months, it will be seen that the transportation of air mail has developed into a business of great importance. It is interesting to note that the Western Air Express at the first air mail line in the world to pay all operating expenses, made a sufficient reserve for depreciation and still have a sufficient amount to declare a dividend after the first year's operation. The progress now made by the other two lines indicates that they will be in the same category in the very near future. The Douglas Air Transport Company is operating the line from San Francisco to Chicago is successfully maintaining the longest air mail route in the world."

The Madison Airline began operation on Sept. 1, 1934, when Col. Lindbergh flew one of his Ford biplanes from San Diego to Los Angeles and returns with a party of San Diego business men. This air line has been in daily operation since that time. As the business develops it is planned to extend this line westward to include Phoenix and Dallas. Supplementary to these chief carriers are several companies in the west offering planes for air mail service, sight-seeing, advertising, photography, crop dusting and firefighting flying instructions. The following table gives some idea of this group:

	1934	1935
No. Operating Co's	2	6
Planes	2	5
Passengers	2	5
Mail	2	5
Freight	2	5
Total	224	900,229

The Transportation Advisory Board concludes that, "while it is realized that the airplane will in no way displace the railroad in handling the great bulk of commerce or passenger movements, the present development of aviation on the Pacific coast would indicate that air transportation can become a valuable adjunct to other forms."



The "Spirit of California" put off the ground on the fourth attempt to set an endurance record.

Captain Kingsford-Smith to Try a Fifth Time

Additional Fuel Tank to be Installed in Endurance Plane

By D. R. LANE

IF THERE would reward for continuous flight does not come back to the United States, the flight will not be with Capt. Charles Kingsford-Smith, Australian ace, and Lieut. George R. Paul, January of the United States Navy. Flown down after 48 hr. 27 min. on their recent fourth attempt to repeat this record from the German, Edmund and Rosten, these two announced before they drove away for some much needed rest that they would try again as soon as another gasoline tank could be installed in their plane.

For some time these two have been trying to fly their Fabre three engine monoplane "Spirit of California" (Hull-ers, Conn.) from Mills Field, the municipal airport of San Francisco or Oakland Municipal Airport and across to the air long enough to bring home the record. Twice last Father found them down after an hour or so in the air. Once a broken gas line caused them to descend. Sunday, Dec. 18, they rose again, found changes in their plane had eliminated the fuel-leak and sailed away hopefully, only to find within a few hours that their gasoline consumption was greater than had been expected.

Nevertheless, they kept going on and only landed at 8:50 A.M. Dec. 20, when their fuel was reduced to four gallons. They did not what is asserted to be a record for all-engined planes. As soon as the local Philip C. Saltsman, flight engineer, began attempting the installation of an additional

100 gal. tank in the fuselage of the big machine, to keep its total fuel capacity up to 1550 gal.

When the Fabre took off the last time she carried 100 gal. of fuel and weighed, all told, 15,200 lb. Her wing loading was 29.8 lb. per sq. ft., and, in view of her performance and sturdy construction, Saltsman said he figured to add 100 gal. of fuel to the 1000 lb. or so of load obtained by adding the new tank.

The plane took off in 35 sec., after a run of 2,600 ft. It touched the ground only once, with one wheel, after a run of 2,900 ft. mark.

A great deal of work was done in making the tail-end which worked so disastrously against the plane. The new fuel tank structure was reinforced a second time, several of reinforcing having been put in when the plane was shut last summer. The rubber was completely re-designed and the after control surfaces were re-aligned to state Lieut. Saltsman, an spokesman for the wavy line, declared it record surely would be brought home in the air and that it was the plane had behaved perfectly in the next attempt. It was the Wright Whirlwind engine released by the National Captains Kingsford-Smith had abandoned perfectly.

Original plan for the flight from San Francisco to San Diego, California, was to be made, via Honolulu and San Francisco, but has been somewhat discouraged by the lack of success, although the endurance flight attempts. There has been talk that the big plane might be moved up from the San Francisco

region to Sacramento, to gain advantage of the three mile runway at Mother Field in taking off for the long hop. There also has been talk of delaying the trans-oceanic attempt until the season of winter storms is past and good land conditions prevail. Nothing definite regarding either report can be ascertained from the firm.

The plane was so practically water-tight communication with the San Francisco Chronicle, which lacked the endurance attempt, throughout the flight by means of a short-wave radio transmitter and receiver. The message told of great worry as the port of the firm after the first 24 hr. of disappointment that the gasoline consumption was running so high, and of emotional rages washed by sea or the other of the two men.

Has a Wing Spread of 72 Ft. 8 In.

The endurance plane is almost a duplicate of the two-engine plane flown to Hawaii by Lieutenant Method and Hegenberger. Its chief difference is that it is four inches shorter in the wing, having a spread of 72 ft. 8 in. instead of 73 ft. Now this difference counted, in an inch on the craft was built from the same design as the Army plane, has never been explained.

"No engineers are still fighting over it," Fisher said recently in Los Angeles.

The plane has a welded steel tube fuselage and welded and tube control surfaces, except for the ailerons, which are wood. The wings are of wood construction, full cantilever and are extremely bowed and shaped according to the Fabre profile. The maximum chord is 14 ft., the wing being tapered both in plan and section toward the tips. The overall length of the plane is 87 ft. The wing area is 712 sq. ft.

The power plant is three Wright Whirlwind J2A engines; they produce pressure in the flow between commercial engines were hooked so far ahead their flight would have been delayed making if they had been compelled to await delivery of commercial engines of the same make.

One engine is mounted in the nose of the plane; the others are mounted in nacelles along under the wings. Each engine has its own oil tank, mounted just off of the motor. These hold one of 15 gal. maximum capacity, including a 20 per cent. reserve for expansion. The propellers are Muntz, a natural choice of material of its flexibility. The oil-cooled propellers turn 50 per cent. of their pitch through the slipstream of the motor propeller and the flexibility is used to

prevent vibration that might arise from this condition. The main fuel tank is of aluminum and holds 600 gal. It is mounted in what would ordinarily be the cabin space of the ship. All of that is an aluminum tank holding 535 gal. and under the feet of the navigator and radio man is a third, also of aluminum, holding 119 gal. In each wing is a brass tank holding 100 gal.

By means of a short cut on the main tank and a three-way valve on the smaller ones fuel can be drawn from any of the two or with. The feed from these tanks runs to a main-



Flushing the Fabre plane out in the morning to be made ready for a take off.

fuel connected with a variable pump of 15 gal. per min. capacity and a wind-driven automatic pump. Both these discharge to the wing tanks, whence the fuel flows by gravity to the ailerons.

The undercarriage was specially built and attached at San Francisco. The chief features are Spaxholm wheels, specially built, and 44x16 in. tires. These are Goodrich Silverstones and were tested before delivery to sustain 25,000 lb. each. The wheels are the first tripple-spoke wheels ever built for an airplane. They have 180 spokes each, arranged in three rows. That is, they have bands the conventional inner and outer spokes of a wire wheel, an additional central row. The wheels have been tested to 45,000 lb. each. Special Blyth roller bearings are used in this landing gear.

The control system is of the Deperdussin dual type, equally adaptable to either of the two men who can be accommodated in the operating cabin forward. These two are equipped by the tank system from the navigator and radio man aft, communication being by telephone, passing messages to and fro



The "Spirit of California" piloted by Captain Kingsford-Smith and Lieutenant Paul sitting down in a three point landing in Mills Field, Calif.

on a stick, or a system of blinder lights actuated by telegraph keys.

When the plane was brought it was without engine. At the Boeing plant Philip G. Sullivan, flight engineer, redesigned the engine mounts, re-designed the fuel system, which was in complete entirety of flexible flexible tubing; and had other changes made, including the reinforcing of the fuselage structure to carry the exceptional loads which the Blenheim sustained, reinforcement of the shock-absorber struts, installation of a new cabin floor, new engine controls, new cooling, change of fittings on the engine mounts and the main-



Lt. George B. Ford (left) and Capt. Charles Kingsford-Smith shaking hands after their fourth unsuccessful attempt to break the endurance record.

lution of the additional loadings. The tank system was equipped with a large dump-valve, rendering it possible to empty the fuel tank with great rapidity.

The instrument system in Finster throughout, except for a least hot compass made in San Francisco, and a blinder bulb unit. The instrument board carries the following: tachometer for each engine; oil temperature and oil pressure gauge for each engine (combined engine gauges mounted within pilot's view on oilhead railing); turn and bank indicator, lateral inclinometer, fore and aft inclinometer; rate of climb indicator, two altimeters, airspeed type; the Finster system of blinder; sides of each indicator mounted (second indicator mounted on navigator's compartment); pressure air compass (magnetic) (second compass mounted in navigator's compartment); a pendulum compass; and air speed indicator (hydrostatic mounted in navigator's compartment).

Other instruments carried include, two speed Williams air-plane indicator, special Williams tachometer, speed and drift meter; and Pitot.

Plane Equipped With Three Wireless Sets

The plane is equipped with three wireless sets, two of which are for receiving and one for transmitting. These are mounted and receiving installation designed to work on 30.5 meters, a long wave sending and receiving and a special emergency sending set, mounted in a water tight box.

All the radio equipment was built by Elmer & Kestman, Inc., San Francisco, which firm built the phenomenal short-wave set with which the final crew of Capt. William J. R. Smith's death plunge into the Pacific was reduced back as his plane fell while he was working for the lost Dele flies.

The short-wave set has a designed radius of approximately 6,000 mi. The long-wave set has a range of between 500 and 700 mi. The emergency set has a designed radius of 500 mi.

This set is provided with a silver wire antenna 500 ft. long and a battery to carry the set. The battery is inflated in need from a tank of compressed hydrogen. It is spread from storage batteries and is completely self-contained.

For the other sets antennas are carried on two reels, one on either side of the fuselage. The expectation is that communication will be maintained with both Australia and the United States on the short-wave set if it is decided to make the Pacific flight. The long wave set will be used for checking the plane course with the radio beacons maintained at San Francisco and on the island of Maui, Hawaii, by the United States Army. By cooperation with the Army, these beacons will be operated in aid the force on their flight from San Francisco to Hawaii and from Hawaii to Java, in the Pacific.

The radio sets are supplied with power from either of two wind-driven generators, mounted one on either side of the plane. These are used to be foot-powered and are a departure from general practice in that they have stationary antennas and receiving fields. They have adjustable driving belts and are mounted in water-tight steel casings, streamlined.

San Francisco Reports Growth Of Its New Municipal Airport

SHOWING 505 flights and landings of planes carrying 135 passengers and hundreds of tons of mail and merchandise in and from all parts of the United States, the first annual business report of San Francisco's municipal airport at Mills Field has been released. The report covers service and a bid under the operation since Mills Field was opened last May. It shows a continuous growth of business and, the December records nearly doubling that of November.

Some idea of the development of business at Mills Field may be gained from the following tabulation:

Month	Flights & Landings	Passengers
May	33	25
June	19	27
July	27	55
August	374	83
September	371	832
October	623	991
November	563 (Decrease due to rain)	755
December	505	1222
	2595	4560

Inspector Miles F. Keat, chairman of the city's airport committee, declared upon filing the report with the Board of Supervisors that provision has been made for expansion of the equipment and average of Mills Field to meet the needs of commercial aviation.

Biltmore Travel Bureau Offers Transcontinental Flying Service

TRANSCONTINENTAL passenger flying is being promoted by the Biltmore Biltmore Travel Bureau, agency of the chain of Biltmore hotels. The first through hotel sold by the agency was a Los Angeles-New York ticket bought by H. E. Sheldahl of the Bankers' Trust Co., New York City, at a cost of \$245.00.

Besides selling passenger tickets to any point in the United States served by a recognized air route, the Biltmore club of hotels provides special care to meet guests on incoming planes, has a paid booth in the dock for the registry of all guests who arrive by plane, and has a special suite reserved for stray petrels only.

Navy Ships Latest Model Vought Planes to Marines in Nicaragua

SHIPED UNDER urgent Navy Department orders, the latest Vought production of Vought "Corsair" is on its way to Managua, Nicaragua, for outfitting the U. S. Marine aviation units. These planes, which are to be used for patrol and expeditionary purposes, are equipped with automatic machine guns and are capable of better than 150 m.p.h. "Corsairs" were used extensively in recent engagements and have been pronounced invaluable for reconnaissance and bombing.

Early in entire load full of these two-motors has also been shipped to the Naval Air Station at Hampton Roads, Va., to be placed aboard naval cruises and battle ships of the Atlantic fleet. Special launching catapults with runs of 143 ft. will be used for these planes during the annual summer cruise of the war ships in southern waters which will begin Jan. 7. The Vought factory at Long Island City is pressed with overtime work to supply the planes in time for the cruise.

The new "Corsair" replaces the older DO model, which for many years was standard equipment for observation and "gunposting" in the fleet. Recent demonstrations have been made, it is said, which prove the "Corsair" can outfly and outmaneuver even the best single-motor pursuit plane at operating altitudes. This plane is a duplicate of those which established three world's speed records and one all-time record. Previous models set by France and Italy were decisively beaten when the Vought plane was flown by four different officers of the U. S. Navy.

Test Two Geared V-1550 Curtiss Engines After 75 Hr. of Flying

TWO 600 hp geared V-1550 Curtiss engines, the first of their type to be put into service, were recently demonstrated for inspection at the Buffalo, N. Y., factory of the Curtiss Company. These engines have been installed in the Curtiss "Condor" bomber, built for the Air Corps, and were started from the plane after 75 hr. of flying time. Upon removal from the plane, they were immediately put upon the rack for calibration of horsepower before disassembly, and

developed 600.4 and 600.8 hp, respectively, at 2800 r.p.m., as compared to the rated hp of 600 at 2400 r.p.m.

The engines were then torn down and found to be in beautiful condition, which was particularly gratifying in view of the difficulty that is often experienced with geared engines. One engine required absolutely no attention except the grinding of four exhaust valves on each bank of cylinders, and replacement of three slightly worn piston rings. The other engine was in practically the same condition. Piston, cylinder walls, main and connecting rod bearings and gear-work were in excellent condition in both engines.

New York to Mexico in Two Days Is Plan of New Air Mail Route

WITH a view of establishing an air mail route to Mexico City, Postmaster General New plans to open negotiations with Mexican postal officials, it has been announced. Lindbergh's recently flight has demonstrated the practicability of a route connecting the United States with points beyond the Rio Grande.

According to plans now being formulated, it is proposed to establish an air mail line from New Orleans to Brownsville, Texas, via Houston and Corpus Christi. It is this trail which Colonel Lindbergh took in his late flight from Washington to the Mexican capital, and when this route is in operation, connecting the line to Tampico and Mexico City will be but another step.

An air mail route between Houston and Fort Worth, Texas, will be put in operation next month. Already, there is a route running from Dallas and Fort Worth to Chicago, and by these various connections mail which formerly took six days between Mexico City and New York will now take but two. Establishment of the new route will bring Mexico City 500 mi. closer New York.

A letter leaving New York at 9 P.M. by air mail would leave Atlanta at 6:40 A.M., New Orleans at 12 M., and arrive at Brownsville at 7 P.M. It would be delivered in Mexico City the next afternoon should the new route go into operation.

Houston's Chamber of Commerce is conducting a good will tour to Corpus Christi, Brownsville, Tampico and Mexico City, it has notified the Post Office Department. This trip is undertaken in the interest of air mail.



A front view of the Smith "Adelbert" recently completed by the Smith Aircraft Corp., Santa Ana, Calif. The monoplane which is stated to be the largest pursuit type monoplane ever constructed, is powered by three Hispano-Helios 155 hp engines. The span of the plane is 30 ft. and the overall length is 47 ft. 6 in., and the height is 12 ft. The dry weight is 4,500 lb., and the rated payload capacity is 1,500 lbs. which is stated as being sufficient for a sustained flight of 21 hr. A complete technical description of the Smith "Adelbert" will appear in an early issue of AVIATION.

Air Service Club, Inc., of Denver Working to Promote Aeronautics

THE ORGANIZATION of the Air Service Club, Inc., of Denver, Colo., is the outgrowth of a desire, upon the part of local war-time pilots, to perpetuate their flying and to participate in the present rapid development of aeronautics, but not for profit. From its inception in July, 1926, it quickly assumed a dominant role in the accelerated development of this aspect.

A commodious club house was erected at Lowry Field, home of the 329th Observation Squadron, Colorado National Guard. Through this arrangement the club house is less than 100 yards from the flight line and is open to public spirited citizens of Denver.

A majority of the members of the club are rated pilots of the Army, Navy, Marine Corps, or civilian pilots under the Department of Commerce. The remainder are citizens of Colorado who have made valuable contributions toward the development of aeronautics in this state. Practically all of the rated airplane pilots in Denver are members of this club.

An important function of the club is a weekly luncheon held each Thursday at the Denver Tea Room. The large attendance at these luncheons is an evidence of their popularity. The purpose of these luncheons is for social benefit and the frequent interchange of ideas upon aeronautical matters. These are developments in engines, planes and equipment are reviewed and all matters pertaining to civil and military aviation, especially in Denver and Colorado, are discussed. Visiting fliers and those interested in aeronautics are urged to communicate with the secretary immediately upon arrival in Denver for the purpose of arranging to attend these luncheons.

The affairs of the club are controlled by a board of seven directors. The officers are: Horace F. Phelps, president; Chas. W. Francis, vice-president; Cliff H. Brundick, secretary; and Ralph W. Hall, treasurer. Correspondence upon aeronautical matters, from other similar clubs, is invited.

To Conduct Experiments in Making Weather Observations From Planes

GOVERNMENT EXPERIMENTS that ultimately may mean that weather observations throughout the country will be taken from airplanes instead of on the ground will be started soon at a number of stations throughout the United States. The Navy will cooperate with the Weather Bureau in forecasting planes and men.

At the North Island Naval Air Station, San Diego; at Pensacola, and at Anacostia—where the Weather Bureau signals from Washington that the desired weather condition has arrived—planes will make 12 trips, each 20,000 ft. into the air for the purpose of recording results. While the planes are functioning, similar exercises will be conducted at 14 kite stations and a number of balloon stations.

The naval plane at San Diego, typical of those going aloft, will be equipped with automatically recording barometers, thermometers, wind gauges and other instruments. Records of the these planes and others taken from the other stations should be compared as an effort to learn the truth of a theory that weather observations, for accuracy's sake, should be taken at some altitude greater than at the earth's surface. Previous efforts to test this theory have been limited to balloons rising with control instruments and leaving time to inform their fliers to release the balloons and instruments in the Weather Bureau at Washington.

Because the general run of planes cannot easily reach 20,000

ft., Wright "Condors" will be used for the tests. At such an altitude the pilot will be immersed in pure oxygen, it is predicted. The experiments are in the nature of pure research for upper air data. Instruments to be carried on the lower wing of the planes, slung by rubbers to avoid unnecessary vibration, will carry pens to record pressure, temperature and humidity. These will be recorded continuously at all levels. Two readings will be recorded during the tests. The top of these will have arrived with a low pressure area over mid-



One of the Wright "Condors" to be used. Note the recording apparatus on the right bottom wing between the first two struts.

the United States and high pressure areas, as the Atlantic and Pacific seaboard. As the low pressure area moves westward in the Atlantic, a second set of observations will be made. Two will provide two cycles, each covering completely a low and a high pressure condition. Those in charge, it is announced hope to discover new data in making long distance weather forecasts. This has never yet been done on a large scale.

Douglas Co., Awarded a \$1,553,505 Contract for 28 PN-10 Airplanes

AWARDED OF a contract to the Douglas Co., Santa Monica, Cal., for 28 PN-10 type airplanes with spare parts and drawings at a total cost of \$1,553,505, has been announced. Delivery of the first plane under this contract will be made in next month and subsequent deliveries will follow at the rate of two each month. The planes will be equipped with two Pratt & Whitney "Hornet" or Wright engines.

A contract has also been made with the Hall Aluminum Aircraft Corp., New York, for one type Y plane with design information, manufacturing data, and drawings at a total of \$212,812. This plane is to be powered by two Pratt & Whitney engines.

To Establish Radio Communication Stations on Salt Lake-Pasco Line

EFFORTS ARE being made this winter to establish radio communication stations on the Salt Lake-Pasco airway at Hurley and Stewart, Idaho, and on the transcontinental route at Rice Canyon, Calif., according to the Aeronautics Branch of the Department of Commerce. The stations will have one operator who will act as controller and weather observer.

The stations planned are intended to expedite the handling of weather information which is not now available at those locations. One of the sites selected is about 40 mi. from the nearest point of communication line.



IN JULY, 1925, a Carno D-12 engine, out of the regular production run and equipped with a set of SRB Ball Bearings, was involved in a DeHavilland plane in Galesburg, Iowa.

Considered as the first one of the most efficiently secured aircraft inspection, this plane has been in almost constant service as an test and former photographic use. From this plane the victory engines of the Venetian forest of John Coughlin were taken, and the specific details of the premonitory signal explosion in Denver, New Jersey were brought in a meeting world in the following morning's newspapers.

In November, 1927, because the plane itself was considered too old, the engine was removed and sent to the Carno Company for disassembly and overhaul. The bearing equipment at the focus end of the crank shaft was carefully examined. The removed end play of the shaft bearing carrying the propeller shaft after 321 hours in the air over two years period of hard, continuous service was found to be less than .0015". That do SRB Ball Bearings with balls forged from Molybdenum Steel pass their rigors.

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P.A.A.

New Keystone XLB-6 Army Bomber Gives Good Performance at Tests

RECENT PURSAC tests of the new Keystone XLB-6 Army bomber at Keyport Flying Field, Bristol, Pa., indicate, it is stated, that this plane will either equal or better the performance of any others constructed for the U. S. Army bombing work. The bomber, which is known as the "Pulsar," is powered with two Wright "Cyclone" 525 hp. air cooled engines.

Developed by C. Talbot Porter, chief engineer of the Keystone Aircraft Corp., the XLB-6 embodies a number of new features. It has a span of but 70 ft., high maneuverability, maximum visibility, and great ease of shipment. The small span of the plane goes away with the necessity of large hangar space, while knock-down disassembly enables dismantling and packing at will.

In obtaining a better performance and maneuverability for the Pulsar it was stated that the armament, useful load, and other military factors to be considered are the same as in other planes of a larger type. Furthermore, according to Mr. Porter the most basic necessary is the production of the XLB-6 as fast as it is needed on the new military requisition. Company officials withheld performance figures at government request, hence only the following information is available:

Gross weight 12,450 lb.
Maximum span 70 ft.
Wing area 1,100 sq. ft.
Engines 2 Wright "Cyclone" giving a combined hp. of 1050

Lieut. Edwin B. Reynolds, government representative of the Air Corps, piloted the bomber during the tests. Those were witnessed by Edgar H. Galt, Keystone president, Elliot Dandridge, vice-president, C. L. Robinson, works manager, and Charles L. Lawrence, president of the Wright Association Corp. and others.

The new plane, according to Mr. Galt, may easily be adapted to commercial use in much the same way as did its predecessor, the Keystone "Santa Maria," now in commercial operation in the West Indies. A payload of passengers or freight, he declared, may be carried with the greatest ease.

Department of Commerce Makes Customs Ruling for Airplanes

NO ENTRY at the customs house need be made by airplanes carrying passengers or merchandise which make three or more trips a week between a United States and foreign port. It has been announced, provided the pilot reports such contribution to the collector within 24 hours after arrival. This follows a regulation by the Department of Commerce under the Air Commerce Act of 1926.

This action is similar to the law regarding seaplanes. Section 481 of the Tariff Act of 1922 defines any water craft or other contrivance used as a means of transportation "in and out of" a port as a vessel. Section 481 of the Tariff Act provides that such passenger vessels making three trips or oftener a week between a port in the United States and a foreign port, or such vessels used exclusively as ferry boats carrying passengers, baggage, or merchandise shall not be required to make entry at the customs house although they must report to the collector of customs any baggage and merchandise they have on board.

Universal Air Service Changes Location and Erects New Hangar

THE UNIVERSAL Air Service formerly of Blackford, Pa., is now located at Bartlettville, Ohio, having leased a field for a long term of years, and has at the present time under construction a two plane hangar which will be completed the latter part of this month. The company will do erect within the next few days a large modern work shop in the purpose of overhauling and repairing of planes and engines, for which work the company is fortunate in having the services and experience of H. E. Jacobs who has many years to his credit in aeroplane work. John W. McManis is chief pilot and fuel-tender and is well known in the middle west.

The company will engage in the usual aviation pursuits a standard standard training and cadet training, and have an interest for the better work in a new plane equipped with a Ryan-Singer engine. It is also distributor for the air for one-page planes in Oklahoma and Kansas and has been on this plane at the factory Dec. 1.

With the new field in operation Bartlettville now has a modern airport, the other field being a privately owned and operated port by the Phillips Petroleum Co.

The Universal Air Service field is one and three quarters miles due east of town having a wind sock, 100 ft. tower, or spire and oil pump on the field available to renting for to whom a careful inspection is attended to take advantage of our facilities.

Minnesota Aircraft Co. Appointed Alexander Eaglerock Distributor

THE STATE of Minnesota, which has heretofore been without an active Eaglerock distributor, has been finally chosen by the Alexander Aircraft Co. as the territory to be covered by the Minnesota Aircraft Co. of Minneapolis.

This new dealer organization is at present composed of J. C. Bonetti, general manager of the Baldwin Supply Co. of Minneapolis, L. W. Chandler, street commissioner of St. Paul, and W. H. Ward of the same city, and Lieut. John T. Smith, army pilot.

The Minnesota Aircraft Co. plans to divide the state into three to five sub-divisions and it will include the Twin Cities and the immediate vicinity as its own active territory.

The scope of activities will include the usual general selling, air test trips, flying instruction, sales and distribution of the Eaglerock and other Alexander products, as well as such other business that is usually associated with commercial aviation organizations.

American Engineering Standards Committee Gets Symbols Report

THE AMERICAN Engineering Standards Committee recently received the report of its sub-committee on standard symbols. The sub-committee is drawing up a set of 100 letter symbols and abbreviations to be used in technical drawings. The National Advisory Committee for Aeronautics is now being distributed in a booklet form a suggestion and summary. Copies of this set of abbreviations may be obtained and suggestions and changes should be sent to Preston B. Miller, secretary of the National Advisory Committee on Scientific and Engineering Symbols and Abbreviations, Electrical Testing Laboratories, 30 St. and 32nd St. Ave., New York City.



Lt. C. C. Champion, Jr., U. S. N., and the Navy Apache (Wasp Engine)

World's Altitude Record

Lieutenant C. C. Champion, Jr., U. S. N. in a navy shipboard fighter has been officially credited with the World's altitude record for land planes with a height of 38,474 feet. Lieutenant Champion and the "Apache" are already the holders of the World's altitude record for seaplanes.



The "Wasp" has again proved its supremacy at altitude, which is so essential in the fighting single and two-place ships. This performance is further proof that American pilots and American flying equipment are second to none.

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DEPENDABLE ENGINES

flight lasted about four hours, after which the fuel pump failed causing the pilots to decide to dump their fuel and land. That night a new pump was installed and the following morning another attempt was made. At the take off the rolling on the landing gear came loose and part of the structure shattering weight, as one of the two engines supporting the fuselage stalled. This piece of wiring remained, however, until they landed. Other portions of the landing gear were torn off from time to time until none of it was entirely destroyed.

Leaky Tank Spills Gasoline

During the first night there was a leak in the left wing tank and before the pilots were aware of the fact they had lost sufficient fuel to spend their chances for a record. It is estimated that about two and a half gallons more at the end of the flight would have enabled them to repeat the previous record and that had they had seven gallons more they would have broken the record. In addition, the gasoline gauges failed making it impossible to tell the rate of fuel consumption. An oil leak was noticed early in the flight but it was not very serious as there was sufficient oil to drop a few gallons into the sea and to lighten the load is a last effort to remain in the air. Just before dark on the first day a connection in the exhaust heater system broke. Fortunately the weather was favorable during the entire flight with only a little fog. To add to the discomfort of the pilots the gasoline that leaked from the wing tank dripped into the fuselage speckling most of their food.

This plane, which has painted on its sides the name "The A. B. Martin", is first of a series of closed cabin seaplanes produced by the Buell Corp. of America at its Arlington, Staten Island, N. Y., plant. This flight was an excellent test for a new plane and with a few minor changes there is no

reason why it should not be able to stay in the air long enough to establish a world's record high above that of the ocean. On the first take off they carried close to 480 gal. of gas, and 21 gal. of oil giving a total weight of about 5,000. On the second take off about 480 gal. of gasoline was consumed, leaving the total weight close to 3,500 lb., or more than was carried on the Columbus on its record breaking trip. They gave a wing loading of 15.3 lb. per sq. ft., and, using the Vought Universal engine at 225 hp., the power loading was 34 lb. per hp. It is believed that if necessary the Buell can use a much greater load than this. When Chamberlain took a plane off at Roosevelt Field he did not follow the very usual by road of the trans-Atlantic there but across the field over the bumpy ground with his heavy load.

An Aviation page to print, men are working on the Buell as at Curtiss Field preparing it for another effort. In adjoining hangar is a Brown seaplane which George W. Brown and Lewis Brown are ready to take off in another effort to bring the endurance record back to this country. At the same field is the Fokker Universal seaplane, "Spitfire" which Bert Smith and Knute Bergan are to use in their attempt to break the record.

Milwaukee School Board Opens New Class in Model Building

THE SCHOOL board extension department, of Milwaukee, Wis., has opened another class to teach boys how to build by model airplanes at one of the school centers. This instruction has been going on at other school centers in the city for several weeks. The new class is under the direction of Elmer G. French, Boy Scout, who is known in Milwaukee for passenger and stunt flying work.

EDO Pontoons and the Waco

THE old standby, the Waco 9 or Edo floats for a long time had the need of an improvement, providing it came to the Great Lakes, Mississippi River and in Florida and Bermuda is carried as pay load of two passengers. Never did it refuse to take off, never did it require much care and it always served faithfully.



Now the Waco 10 equipped with the same Edo floats takes its place. Still more aerodynamic, still better adapted for carrying passengers, still more practical, it sets a new mark of utility for seaplanes. The waves of Atlantic Ocean are not too rough for its rugged floats, the calm waters of Adirondack Bay are not too smooth to take off from. Easy to land, easy to fly, a good climber, and a

speedy ship, it is an ideal seaplane from pilot's point of view.

The ship offers great convenience to passengers. The floats have shallow draft both at the stern and at the bow. The ship may be brought close to the beach, and passengers can step right on to the flat and wide decks of the floats. Two easy steps up the

ladder and they are on the walking board of the ship. The door in the side of the fuselage lets them enter and disembark with ease and comfort. Very easy to get on it is an exceptionally pleasant ship to fly in.

More than 20 manufacturers of Edo floats on Waco 9 and 10 seaplanes were made in 1928. Many more will be made in 1929. For pleasure flying, for commercial work or for maintaining a difficult to land a seaplane has adapted to its purpose than a Waco on Edo floats.



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Side Slips

By ROBERT R. OSBORN

In the A. B. Martin, the writer calls our attention to an article entitled "True Flight" in one of the aviation New York magazines, which speaks much in clear and unambiguous language of the theatre and bookshops. The writer apparently witnessed the test flight of a large plane at an outdoor field and in his short visit acquired quite a smattering of the talk at some of the following groups of men.

"There as they stopped back, behind their hands, the gas was down and the engine roared at full power. . . . Two heavy motors, of six hundred horsepower each, gave all of this power to the turning of two big steel blades."

"The last had landed from another field. "Going back right away," he was asked. "Hope. Two hours more, and my right arm is about to drop off. Ted Henry. Takes a Stinger Lewis to hold that baby's head up!"

"That took the blazes from beneath her wheels, and he got carried up her motor's."

"Blasphemy! I got a shock when she's throttled back. Didn't even think of it."

The making of the motor quite appropriately made his work very "Occasionally, men turn out to be quite remarkable men."

It seems that the trip of dovetailing aviation is going to be of bumper proportions this year, as two letters from Los Angeles already have been turned over to us, one of which was addressed to M. H. M., in charge of a famous flying service, and the other addressed to a large manufacturer of planes.

The first proposed invention, to summarize the inventor's letter, is a simple moving device between the motor and propeller, whereby the propeller will make no more the number of revolutions it would make in the common, or garden variety of design. "In other words," to quote from the letter, "if an engine was running at a speed to convert the plane through the air at 50 m. p. h. and the driver in front of the motor, the Propeller would make no more the 1,000, and would it not convert the plane at twice the speed?" In my opinion it would be worth while in quick service with planes in mail service and quick service in cases of accident or death or various emergencies that are daily occurrences.

The writer of the other letter gets downed up to his subject immediately, in fact, gets quite adamant about some of our shortcomings. "It seems utterly ridiculous for designers of airplanes to put such heavy motors in their places just to get the required power. Why should a heavy two hundred horsepower engine be put in a seaplane? Didn't the designer think of the simple scheme of getting a fifty horsepower engine in and getting the propeller up four or six feet?" So that we may do our bit toward the progress of aviation, we shall be glad to turn the names of these inventors over to our severe and reliable manufacturers.

The reports show a number of writers flying fields of student who have learned to fly in a single day's instruction, read to us of a construction we conducted at Roosevelt Field, after Lewis had pulled his very surprising stunt of jumping Chamberlain on the field to Germany of "The Columbus." After the plane had cleared the field and was disappearing over the town on its way, someone in the crowd shouted and asked, "I wonder if Mr. Lewis knows how to fly?" From someone else came the answer "Well, if he doesn't he can learn on the way over." Chamberlain can give him sharp-five hours and one landing."

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National Air Transport, operating the Air Mail and Express lines from New York to Chicago and Chicago to Dallas, uses us.

"Of the 11 Curtiss-Reed propellers which we now have we have one 1,600 horse power, one over 900 horse, one over 850 horse, two over 750 horse and the remainder between 500 and 900 horse."

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AIRPORTS AND AIRWAYS

Worcester, Mass.

By Henry T. Ford

The first freight car delivery of airplanes is expected in this city late in January. The New England Aircraft Corp., which has leased Whittell Field as a flying school and passenger depot, is the purchaser, and the planes will be assembled at the airport. They are three Waco 10's, one of which is equipped with a Ryan-Hessman engine. The Ryan-Hessman engine plant is to be delivered to Henry Lindell of Bennington, Vt., while one of the other planes has been purchased by Harlan W. Collins, a student here and sales representative of the New England Aircraft Corp. at Worcester county. The third will be used for student flights.

Comde Richard E. Byrd will give a lecture here Feb. 9 under the auspices of the Worcester Airport, Inc. The arrangements are being made by James F. Whittell who is assisted by a committee. It is expected that Commander Byrd will fly to this city.

With the granting of a Federal license to General Boardman of Lowell, Mass., only two solo students remain at Whittell Field, John W. Leach of Whitcomb, Mass., and George Kneeling of Upton, Mass. Boardman was granted a license by Waco Airport, Federal aviation inspector for New England. Other students receiving instruction are Harlan W. Collins, Arthur J. Flynn, Joseph H. Reynolds, Hugo Upgill and Miss Nelson of Worcester; L. J. Sanders of Gardner and Felix A. Zerkow of Woburn, Mass.

New Hangar Built

Another new hangar, the third to be constructed at Whittell Field, was completed recently and is being used as a store house for Waco and Fairchild planes. The hangar is 90 ft. wide by 30 ft. deep. One section of the hangar is used as a machine shop, while a small kitchenette and rest room have also been installed. The hangar is owned by M. Walter Whittell, owner of a four passenger Fairchild.

Work as a third airport in Worcester county will start in the spring, according to an announcement made recently by Phoenix A. Mills of Cambridge, Mass., formerly at Alhambra, N. Y. He has purchased 128 acres of land in Mendon, Mass., 10 mi. southwest of Worcester, which is considered an ideal location for a flying field. Mr. Mills owns a plane which is stored at the Boston Airport.

In his announcement Mr. Mills stated that work on the new field, to be modern in every way, will be started as soon as the first freeze has passed. There is a large house and barn on the land which may be utilized. The land, well suited for the purpose, will require but a minimum of grading.

Engineers who visited the property previously to the purchase by Mr. Mills state that the site is ideal as it is completely free from the fog which has caused considerable trouble to them in the section of New England Mr. Mills plans include a large hangar and boundary lights for night flying.

General Boardman of Lowell, Mass., has the honor of being the first student here to be issued at Whittell Field. How-

son started his training at Brainerd Field, Hartford, but with the November opening of a flying school here by the New England Aircraft Corp., he transferred to this field. Boardman has been under instruction by Capt. R. E. Thompson and expects to make application for a Massachusetts license in the near future.

Leslie H. C. "Kit" Burrows, vice-president of the New England Aircraft Corp., closed press association accounts.



Whittell Field, at Worcester, Mass., is used for training student flyers and for the demonstration of Waco Trim and two-passenger Fairchild cabin monoplanes. The school is conducted by the New England Aircraft Corp. of Hartford, Conn. Photograph shows a New England Aircraft Corp. plane standing in front of the hangar.

sle very recently when it was reported that he had left Boston, N. H., with a cargo of six seedlings for Hartford, Conn. "Kit" had at Whittell Field on route from Salem and it was discovered that he had only one monkey aboard his mascot. Because the "monkey flight" would have been the first assignment of monkeys ever carried in New England for commercial purposes, the interest of the press association was great.

A ground school for mechanics may be started at Whittell Field under the auspices of the New England Aircraft Corp. The inspection for the school comes from the 12 student men now receiving instruction. Decision has not been announced but it is generally believed that the school will be located. Plans do not expect to make many flights during the winter months as the snow in this section usually reaches a depth of several feet during January and February.

Caterpillar Club Enjoys

Although flights have been made regularly from Whittell Field for two months none of the flyers are eligible for membership in the Caterpillar Club—as yet. The smallest incident at Whittell Field has greatly encouraged interest in flying as the action with the result that passenger business was good and old weather proved. Flights in two-passenger planes were more popular than those in multi-seated machines.

The representatives of the Massachusetts Aviation Commission that the landing field at Framingham, Mass., 24 mi. east of Worcester, be leased to the town has aroused great interest in aviation in this section. The field is large enough for a landing but because of trees and abandoned Army build-

ings it is difficult to develop. The field was used as a camp for Massachusetts Army units for several years previous to the establishment of Camp Devens. Framingham Chapter of the Aero Club has long been active in attempting to convince state authorities to develop the field for aviation purposes. The field will probably be affected after the report of the state aviation commission has been accepted by the state legislature.

As work is being made to have the Department of Commonwealth in looking for the establishment of lights at Whittell Field, officers of the Worcester Airport, Inc., in course. Airport has been made to the Washington bureau but no decision has yet been announced.

Portland, Ore.

By John R. Anderson

Portland's HIL Flying school has just opened with 20 people as students. It is in the Macintosh-Goff School, operated by Capt. Art Macintosh and R. S. Goff, former aviators of the Navy. The Macintosh-Goff Co. is Oregon and Washington distributor for the American Eagle airplane. The school is located at the foot of 20th Street, where a branch school has opened at Hood River, Ore., with 15 students.

Macintosh, chief pilot and president of the company, gives the practical instruction in Portland. The ground school is given by experienced men of the Adkins and Aviation School. Leslie W. A. Davis directs the Hood River branch. Macintosh, former Army pilot, was recently called to active duty in the recovery of flood conditions along the Mississippi. After Portland flying schools are Seaside School of Flying, Hill Air Line School, temporarily conducted in Vancouver, Wash., the HIL School, conducted in connection with the HIL Military Academy and the Adkins School.

The Seaside office receives evidence of the great interest in aviation. On a recent Sunday and Monday the Seaside Airport carried more than 100 passengers despite the fact that the weather was bitterly cold. Batches appear on an early basis in connection with the school and airplane supply and Oregon and Washington spots for flying schools, glider, biplane, and other accessories.

To Have Exhibit Feb. 4-11

McDonald Frank, leading Portland department store, has announced a combination aviation and motor boat show for Feb. 4-11 in its new delivery depot. The exhibit is sponsored by the Portland Marine Yacht Association and is directed by an expert in aviation of modern transportation. The exhibit of planes are not complete but it is known that the latest model Ryan planes have been promised by A. J. Bland, sales manager for the Ryan plane distributor. A North Pacific monoplane, owned by the HIL Light Plane Club, on display in a downtown show window. Bland expects to be able to see the top line. Favorable weather is needed for the first flight.

The Aero Club of Oregon, local chapter of the National Aeronautics Association, meets every other Monday night in the auditorium of Commerce clubrooms.

W. D. Curtis, former pilot, Ore., vice dealer, has purchased the interest of J. J. Brown in the Hill Lane Air School and assumed active management.

James Albert, instructor in the HIL Aeronautical School, has been East to discuss economic and business phases of aviation with air authorities.

Two four-passenger multi-engine planes are to be purchased by the Pacific Air Transport Co., holders of the Pacific coast mail contract, to ease the increasing transportation demands. The new planes have as yet not been chosen. Vernon O. Goss, president of the firm, will announce the type upon his return from a visit to Los Angeles. Lead, Oakley

AVIATION

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Melbourne Airline, off Dudley Street

G. Kelly, commander of Portman Field, Vancouver, Wash., has gone by train to Dayton, O., to receive a Douglas C-40 in the field. The plane is to remain in the area after a brief visit to the East.

With the thermometer below the freezing point and the wind blowing a gale, Lord, Gordon E. Moore, Army Reserve, piloted a Bell Army School Travel Air biplane to a new unofficial world record for a plane powered with OX5 engine and carrying two passengers on Dec. 22 at Fort Meade, Ore.

The altitude reached was 34,000 ft. The passengers were Harry Stoddard, assistant editor of the Portland News, and Frank Dady, former Pacific Northwest open golf champion. It was Del's first flight—by plane.

The flight was made to back up Moore's answer to Lord Russell's challenge. Recently, a few weeks ago, he set English record plane to 35,000 ft.

Gen. Russell, a Ford Purified four, made 15,300 ft. in his West. Russell was not alone, but he has been Moore's record but plans to wait until warmer weather to do it.

At 1 P.M. the Travel Air took off at Mead's Bottom, commercial flying field here. Blasts of wind nearly stopped the flight before it was well off the ground but Moore finally managed to get it into the air.

The plane apparently climbed the whole sky until it approached 3000 ft. There it found rain, and the rest of the climb was easy.

At 2:45 P.M. the peak was reached. There the plane was held until the pilot had absolutely drunk a little coffee to combat the terrible cold.

Coming down, the plane was driven northwest to Longview, Wash. Moore thought it best to land there and get warm, but ground air currents were too dangerous, so he turned the plane toward Portland. Mead's Bottom was also covered by bad winds and the plane bashed into Portman Field, Army base at Vancouver, Wash. There a landing was finally accomplished, and all three men, who were so cold that they had difficulty walking, were happy to leave the plane.

New Orleans, La.

By Theodore E. Linn

The New Orleans-Alabama air mail route is now scheduled to open about Aug. 1, according to information received by the St. Tammany-Gulf Coast Airways, Inc., which holds the contract. It had been believed that the service would start about April, but according to a telegram received by William DeWald, operations mgr., from C. I. Stansbury, army aviation superintendent of the Department of Commerce, the survey of the route will not be available until after July 1.

Preparations are being made by the St. Tammany-Gulf Coast Airways, but no steps are being taken for flying and airplane maintenance. Crews will be given at the airport in the Alton Cullender field, and the plane will be constructed at a cannery at which out-of-town students are said to come and board at a low rate. The school will be conducted under regulations prescribed by the Department of Commerce. It is expected to open about Feb. 1.

An elaborate complex is being planned for Des Moines (Iowa) and Joseph Lebrun, French aviator, whom they arrive in New Orleans. Members of the aviation committee of the Association of Commerce are in charge of the plans. The aviators left France several weeks ago on a good way out around the world. They flew across the south Atlantic, but left in South America, and later crossed the continent to visit Ohio.

B. D. Griffin, commercial aviator, recently flew from New Orleans to Mexico City, carrying a Puffinberger message to take place in the city of the state of Col. Charles A. Lindbergh and Mrs. Evangeline L. Lindbergh. He arrived

On the 25 Special Boeing Mail Planes

"All of the Tie Rod Stock used on these planes and all of the Screaming Interplane and Knappermae Breezy Wings were supplied by Macwhyte Company. We have used Macwhyte products for the past several years and are very much pleased with the service and cooperation received"—from letter signed by Gardner W. Carr, Boeing Airplane Company, Seattle.

Write for more details. Macwhyte Company, 2908 Fourteenth Ave., Kenosha, Wis.

MACWHYTE Streamline and Round TIE RODS

Cullender in Touch With Mexico

The New Orleans Association of Commerce for many months past has been working in behalf of the Mexico City line, according to General Tombs. Marshall Cullender, secretary of the aviation committee, has been in communication with the aviation committee of Mexico City and airplane associations along the proposed route, and General Tombs has attended witnesses in Washington regarding the matter.

General Tombs believes that in the near future there should be airplane lines connecting all the principal cities and all of the Mississippi River with New Orleans. All air mail bound to Latin American countries from points east of the Mississippi should pass through New Orleans, he says.

The New Orleans Airport Commission reflected all officers at a recent meeting. The officers of the commission are Gen. L. A. Tombs, president and general manager, Marshall Cullender, first vice-president, Allen S. Hockett, second vice-president, George A. Hertz, Jr., third vice-president and superintendent, Alvin Walters, secretary, and J. D. Bryson, treasurer, and Capt. Frank S. Bledsoe, executive secretary.

General Tombs has been authorized by the commission to form a permanent committee whose business will be to obtain air companies for the field. A flying field in City Park assumes cover up for discussion, but no action will be taken until the members have time to study the proposal.

At a meeting of the aviation committee of the Association of Commerce no action was taken on the proposed landing field in City Park stadium. The matter was tabled for a week in order that additional data might be obtained. Raymond and Marshall Cullender acted on the committee.

With many applications for enrollment received, the flying school announced recently by the St. Tammany-Gulf Coast Airways will be opened within a few days, it was announced by William DeWald, chief pilot of the organization and manager of the school. The school will be opened at Calumet Field, where a dormitory has now been built at which students may board and lodging. This building was erected by the airport commission.

The courses will follow the curriculum of the Department of Commerce. Mr. DeWald stated. Flying and airplane mechanics will be taught, and the school will be operated both by day and night.

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Oklahoma City, Okla.

By Ernest W. Fox

Many air events have occurred here recently as a result of the rapid increase of these events in the past few months. City appears as air was an easy city to fly.

Much recently has been talked concerning the Oklahoma City plane. It has now been announced that the plane has been sold, and the new owners appear to try shortly in the near future, flying between Oklahoma City and Wichita.

D. D. Shuler, part owner of the Southern Stage Line, and A. E. Greenleaf, partner of Shuler in the Kansas line, are part owners of the new flight. The plane has been purchased. The plane is a Travel Air company and will be purchased on the plane being sold to the Oklahoma City with Al Hendley and Bennett Griffin as pilots. It was flown to town back in the race because of a gas trouble. L. L. "Pete" Lewis, formerly of Oklahoma City and well-known in this vicinity as a flier and during winter will be one of the pilots, according to the present plan. The other pilot has not yet been selected. Oklahoma City of Wichita are to put up a \$10,000 purse to be given the first of the record of 52 hrs. 22 min. 31 hr.

To Begin Night Flights

Air mail plans of the National Air Transport Co. to begin night operation on a schedule as soon as air line between Fort Worth and Lawton, Texas and between Boston and Fort Worth have been lighted, but A.T. office has announced. The Texas line are waiting for approval to be shipped to them. They will use the new National Air mail plane.

A certain distinction belongs to the owner of the Taylor garage here, who claims to be the only man ever to be involved with an airplane propeller still alive to account for it. The accident occurred when Edward A. Farn, the garage man, was up with Marie Bader, former Oklahoma City flier, at the old Capitol Flying Field north of the city, and now abandoned. A tail spin, a loop, a wing dip, some fire and other maneuvers were recorded in the plane making Farn's duty, very close, in fact so close that he didn't know who was out of the plane from the air. Farn was getting out in the rear of the plane after it had been tilted out to front and half backed his way, half left, in range of the propeller. A long gas in the rear was made, but Farn is still alive and happy.

The Chamber of Commerce is distributing guide maps and envelopes, and has also distributed.

The Southwest Airways Co. will not make special flights to stranded people in Oklahoma City at Christmas time. Bob Thornton is manager of the company.

The Southwest Motor Co. informs on North End way has had an airplane in the vicinity of the city. The airplane was apparently damaged and was made under Oklahoma City is now to have an airplane engine from Frank Gough, former engine man who has received a new airplane engine and to be worthy of exceptional performance in now awaiting pilots. As soon as they arrive his engine is to be repaired and manufactured begins.

Cincinnati, Ohio

By C. E. Plunk

Cincinnati has an aviation group studying of the experiment in various forms of aerial activity who are supporting before country service clubs and other organizations throughout the city. Recent weakness interest in aviation has resulted in this innovation. The new area appears to

one group, and either discuss the subjects in which they are specially qualified, or answer any questions submitted from the citizens.

The president of the group is Ralph Graceman, chief designer of the Hinkle Development Co.; Thomas E. Hinkle, president of the Hinkle Development Co.; T. Hinkle, secretary of the Hinkle Development Co.; John Paul Hinkle, general manager of the Hinkle Development Co.; Stanley C. Hoffman, president of the Hinkle Development Co.; and Charles E. Hinkle, vice-president of the Hinkle Development Co.

Group deals with design and construction of aircraft, flying with operations of regularly established airlines, flying with solo and private ownership of airplanes, Hinkle with solo and student instruction, Hoffman with construction and general ground work for airplane operation, and Hinkle with aviation research and research service. The group is expected to be discussed authoritatively from a local, national, or world aspect.

Bright Future Indicated

Cincinnati's recent acquisition of Lindbergh Airport as a municipal field, the opening of the International Airport Co. from Long Beach, Calif., in Cincinnati, the opening of the Hinkle Development Co. as the air mail route to Chicago, the preparation by the Continental Air Lines to use Cincinnati as a base for operations on their Louisville-Cincinnati air mail route, and other enterprises of this kind indicate a bright future for the Queen City in aviation.

A frequent visitor to Lindbergh Airport is Richard Allen in the Hinkle Development Co. airplane operated by the A. W. Shaw Publishing Co. for use by its executives, and for obtaining figures on the operation costs and incidents for modern airplanes.

R. L. Patman, vice-president and general manager of the company is using the plane most of the time. He and Allen keep a detailed log of their trips which include comments on every aspect at which they land, temperature, wind, direction, time, gas and oil expenses, storage expenses and any unusual incidents connected with their flights. Allen does not say a machine had depends on getting expert service at the field he visits. They fear he has been able to keep his plane and engine in perfect condition in this way.

Patman plans an extended speaking trip in connection with his business, leaving New York and visiting Richmond, Va., Springfield, N. C., Augusta, Ga., Jacksonville, Fla., Atlanta, Ga., Chattanooga, Tenn., and Louisville, Ky.

Newsmen, Ill.

By Edna E. Kelly

In preparation for the spring rush for new airplanes in 1932, the Midwest Airways Corp. has placed an order for a number of Waco 2Fs with the Advance Aircraft Co. delivery to be made shortly after the first of the year. The Midwest Airways Corp. is the distributor for the Waco 2Fs. Monographs in Illinois and Iowa and in just closing down in Wisconsin and Indiana of planes to the company. The organization, now being organized for next winter, will be organized shortly.

During the delays of last summer, the Midwest has been able to take at least one plane each week through the winter months, shipping the entire planes to have them available for delivery next spring. The new have done very well, however, to take delivery on planes during cold weather in order to have them on hand when the flying season opens.

Over 10 Waco, Kinner and Teas, have been delivered to Illinois. The Waco 2Fs are the last 10 months by the Midwest Corporation. Recent deliveries, made this fall,

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COLLEGE POINT, L. I. N. Y.

U. S. Army, was stationed at Fort Leavenworth, Kansas, in June joining the Army flying school. He now owns a motor.

Ray District aviation courses are anticipating with expectation the return of Art Skelton, for years a Glenside Pilot and winner of the Dole Hawaiian flight prize. Skelton is expected to reach Southern California from New York on 18 and contemplate attempting a new world's endurance flight record in the Westerns, the plane which carried him safely across the Pacific to the Hawaiian Islands.

Madison, Wis.

By M. A. Lindbergh

Included in the experiences in flying that finally led up to the present aviation activities in Madison are those of Mr. Harry L. Peiser, who purchased a ship a few years ago for the war for exhibition purposes and for passenger travel. The first plane wrecked, the pilotless machine in order to continue his flying. Former pilots of the world war, who were students at the University of Wisconsin, acted as pilots.

Harvey E. Barr of Wisconsin, world war flyer, introduced a group of pilots and others to the extent that the Wisconsin Chapter of the National Aeronautic Association was organized on Nov. 24, 1924. The charter members were W. A. Davis, H. E. Barr, C. E. Chamberlain, W. J. Lawrence, Charles W. Lund, Joseph A. Page, H. Russell Gentry, F. D. McGuire, G. T. Colburn, and Walter A. O'Leary.

These relations in the progress of aviation in Madison are but two of a number of activities previous to the transatlantic flying period that have been formative to others of more wide spread importance such as the acquisition of a complete pilot report and the beginning of direct air mail service to and from the city. Madison, therefore, is now only about 25 hours distant by air from San Francisco and about 12 hours from New York City.

One of the students receiving flying training—a French girl married to an American during the world war—held her license when she left. From that time until she returned to the city she had learned to fly. She is determined to make her activities.

Schenectady, N. Y.

By Milton S. Turk

With the exception of a permanent floodlighting system, the new airport is now completely equipped with up to date lighting systems. The General Electric Co. is preparing the definite installation of the floodlighting with exhibition tests are completed with all types, including the neon light. The New York Power and Light Co. installed the equipment under the direction of W. E. Thomas of the General Electric Co. The subsequent chapter of the N.Y.A. has been active in all of the local activities concerning aviation development. The officers of the chapter are H. G. Stinson, president, Mr. Hesse, treasurer, G. E. Young, vice-president, and J. H. Army, secretary.

V. A. Hubbard, in charge of the new field reports it is the local weather has showed up flying activity, but that all local pilots are preparing for a very busy 1928.

The "Diamond", a float plane owned by J. H. Bell, of the Kensington and Broad-Corcoran Corps, was a recent addition to the new airport. The plane is making a few flights and is piloted by N. C. Henderson, with G. Kennedy as flight instructor. Packed up with a small office, the plane is scheduled to be converted to travel to distant business meetings in the shortest possible time. A unique structural feature is the use of a tail wheel instead of the conventional drag.

"Golden" Stinson stopped here on a trip from Wood to Detroit. Captain Jones of Old Orchard, Maine, a Mr. Whittall of Worcester were also recent guests of the p.

UNITED STATES AIR FORCES

Develop Anti-Aircraft Machine Gun Mount

Inspired from recent research and experiment by the Department of Experiment of the Infantry School, Fort Benning, Ga., there now has been developed a mount for the six to 20 machine gun which facilitates anti-aircraft protection by activity on the march, in bivouac and in battle. Although not finally tested or approved, the new mount has shown some possibilities in preliminary trials conducted at the Infantry School as to warrant a belief that machine guns of the Infantry will in the future be much more effective against aircraft.

The experimental mount consists of a wheeled carriage, labeled in the rear of the ammunition cart, the 1917 tripod, and an adapter attached to the top of the tripod which permits the gun to be placed in a position for either fire on ground or air targets and to be rapidly converted from one to the other. Detachable wheels on the carriage permit the gun easily mounted to be dropped to the ground in the line of the carriage when used for ground targets. The gun assembly, the wheeled mount and the ammunition cart, a fire by one man. The wheeled carriage is a radial design from the present method of transporting the gun which requires that it be partly disassembled and packed in a cart.

When attached by airplanes on the march the carriage is to be unrolled, the axle dropped on the ground and the aircraft fire brought to bear in three seconds. Previously, protection on the march was accomplished by stumping the gun, mounted on the tripod, to the top of the machine

gun staff. This method necessitated keeping the axle on the road and made difficult all-round fire, especially when the direction of the target continued the greater to place himself at the mercy of the winds, between the axle and the staff.

In battle, when conditions prohibit further advance for the unit, the carriage can be unrolled and driven by hand ready for line support against and quickly transformed into a ground mount by dropping off the wheels and, if necessary, at a moment of difficult ground, detaching the tripod staff from the carriage.

Advance School Graduates

It is interesting to note that since June 26, 1925, the Air Corps Advance Flying School at Kelly Field, San Antonio, Tex., graduated a total of 535 students in the regular pilot's course. Among these graduated pilots were 147 officers of the Regular Army, 10 enlisted men, 140 flying cadets, 3 naval aviators, 4 Marine Corps officers, 6 foreign officers and one foreign cadet.

Beside the data mentioned, eight foreign countries have sent students to the Advanced Flying School, in Peru, Chile, Argentina, Colombia, Mexico, Spain, Norway and Cuba.

Canadian Officers to Visit San Antonio

The War Department has received a request from the Canadian Minister for permission for two officers of the Royal Canadian Air Force, namely, Wing Commander G. M. Cull, A.F.C., and Squadron Leader L. L. Broadhead, D.F.C., to visit the Air Corps Training Center at San Antonio, Texas, for a period of approximately one month for the purpose of studying Army Air Corps training methods. This request has been approved by the War Department and detailed arrangements are being made for the proposed visit of the Canadian officers.

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